March **2014**

HFD / HFP Series
Horizontal Air Handler

Installation – Operation – Maintenance

The HFD / HFP Series is designed for horizontal recessed installations in a furred down area, above a suspended ceiling or recessed in the ceiling. The HFD model is for electric heat with DX cooling. The HFP is used for heat pump applications. Installation slots are built into the cabinet to facilitate mounting the unit. Electric resistance heaters are available.

Installation Instructions

Installation of this unit shall be made in accordance with the National Electric Code, NFPA No. 90A and 90B, and any other local codes or utilities requirements.

Warning:

Due to possible damage to equipment or personal injury, installation, service and maintenance should only be performed by a trained, qualified person. Consumer service is recommended only for filter replacement.

Warning:

Ensure all power is disconnected before installing or servicing this unit. More than one disconnect device may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury. Make certain all panels are in place before operating this unit.

Warning: The United States Environmental Protection Agency (EPA) has issued various regulations regarding the introduction and disposal of refrigerants in this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. Because these regulations may vary due to the passage of new laws, we suggest that any work on this unit be done by a certified technician.

Unpacking

Carefully unpack the unit and inspect the contents for damage. If any damage is found at the time of delivery, proper notification and claims should be made with the carrier who delivered the unit. Caution should be used when lifting the unit to **avoid lifting by the blower wheels.** Improper handling can damage the blower wheel causing excessive vibration during operation.

Check the rating plate to assure model number and voltage, plus any kits agree with what you ordered. The Manufacturer should be notified within 5 days of any discrepancy or parts shortage.

Location

The HFD and HFP series is designed to be installed in a recessed area, (furred down) between floors, ceiling/attic area or hung in an acoustic tile ceiling. Units may be installed in hallways, over bathrooms, or in a commercial drop-in ceiling. These units are designed for indoor use only in a horizontal position.

AllStyle Coil Company, LP
7037 Brittmore
Houston, TX 77041
Phone 713-466-6333 Fax 713-466-6363

This unit is approved for "0" clearance from any side, front, rear or duct work. The unit must be installed in a level position to ensure proper condensation drainage. Make sure the unit is level in both directions within 1/8".

The unit incorporates installation tabs that mount to the framing and provide a ½ inch flange to trim to the finished edge of a sheet rock ceiling. The access panel mounts to the cabinet and trims the installation.

Before attempting installation, the following points must be considered:

Structural strength of supporting members

Clearances and provision for servicing

Power supply and wiring

Air duct connection

Drain facilities and connections

Duct Work

The duct work should be installed in accordance with the NFPA No. 90A "Installation of Air Conditioning and Ventilating systems" and No. 90B "Residential Type Warm Air Heating and Air Conditioning Installation."

The duct work should be insulated in accordance with the applicable requirements for the particular type installation as required by HUD, FHA, VA the applicable building code, local utility or other governing body.

Condensate Drain

The unit is supplied with 3/4 inch primary and auxiliary condensate drains. Both drains must be trapped outside the unit and piped in accordance with applicable building codes. Do not reduce the drain line size less the connection size on the drain pan. Condensate should be piped to an open drain or to the outside. All drains must pitch downward away from the unit a minimum of 1/8" per foot of line to ensure proper drainage. **PVC glue is not approved or recommended on drain pan fittings, If required, use only 100% Teflon thread sealant or Teflon tape. Caution: Do not over tighten the fitting. Note: there are two small pieces of duct sealant putty in the bottom corners on the air discharge side of the drain pan. It is important that you seal the small air gap between the drain pan and the ductwork to prevent water from splashing out of the pan during AHU operation.**

Refrigerant Piping

Refrigerant pipe connections are located on the top of the unit. Refrigerant piping external to the unit shall be sized in accordance with the instructions of the manufacturer of the outdoor equipment. When units are recessed mounted in the wall, make certain that piping connections are pressure tested prior to the wall being closed. **Manufacturer does not insulate the expansion valve distributor tubes or liquid lines coming from manifold. It is the sole responsibility of the contractor to properly insolate from condensation.**

(YOU MUST INSULATE THE REFRIGERANT LINES AND TXV UP TO WERE THE PAN CATCHES ALL CONDENSATE DRIPS.)

Metering Device

All units are shipped with a check-flow piston installed which is designed for air conditioning or heat pump operation. If your application requires a thermal expansion valve or check expansion valve then it is necessary to remove the piston from the distributor assembly and install the proper metering device. Be sure to follow the instruction in the kit to ensure proper installation.

Wiring

Consult all schematic and pictorial wiring diagrams of this unit and the outdoor equipment to determine compatibility of the wiring connections and to determine specific requirements.
All field wiring to the blower coil should be installed in accordance with the latest edition of the National Electric Code NFPA No. 70 and any local codes.
Check rating plates on unit for rated volts, minimum circuit ampacity and maximum over current protection. Supply circuit power wiring must be 75 degree C. (167 degree F) minimum copper conductors only. Copper supply wires shall be sized to the National Electric Code or local code requirements, whichever is more stringent.

The unit is shipped wired for 230/240 Volt AC 60 HZ 1 Phase Operation. If the unit is to operated at 208 VAC 60HZ, then follow the instruction on the indoor unit wiring diagram to change the low voltage transformer to 208 VAC operation.

Be sure the unit is properly grounded.

Class 2 low voltage control wiring should not be run in conduit with power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used. Low voltage control wiring should be 18 Awg, color coded (105 degree C minimum). For lengths longer than 100ft., 16 Awg wire should be used. Make certain

that separation of control wiring and power wiring has been maintained.

Thermostat

Select a thermostat that is commonly referred to as a single stage cooling with electric heat sub base. This stat will energize the fan on a demand for heat or cool.

Install the thermostat on an inside wall, away from drafts, lights or other heat sources in a location that has good air circulation from the other rooms being controlled by the thermostat. The thermostat should be mounted 4 to 5 feet above the floor.

Sequence of Operation

Cooling (cooling only or heat pump with reversing valve energized in heat mode). When the thermostat calls for cooling, the blower relay is energized. The N.O. contacts will close, after a time delay, the indoor blower will operate. The circuit between R and Y is completed: causing the contactor on the outdoor equipment to close and start the compressor and the outdoor fan motor.

Cooling (heat pump with reversing valve energized in cooling mode). When the thermostat calls for cooling, the circuit between R and G and R and O is completed. Circuit R and O energizes the reversing valve to the cooling position, Circuit R and G energizes blower relay. The N.O. contacts will close, after a time delay, the indoor blower will operate. The circuit between R and Y is completed: causing the contactor on the outdoor equipment to close and start the compressor and the outdoor fan motor.

Heating (electric heat only). When the thermostat calls for heat, the circuit between R and W is completed, the heat sequencer is energized. A time delay will occur: Then the heating element(s) and the indoor blower motor will come on.

Heating (heat pump reversing valve energized in heat mode). When the thermostat calls for heat, the circuits between R and B, R and Y and R and G are completed. Circuit R and B energize the reversing valve switching it to the heat position. Circuit R and Y energized the outdoor unit contactor starting the compressor and outdoor fan. Circuit R and G energizes the blower relay starting the blower motor.

If the indoor room temperature should continue to fall, circuit R and W2 is by the second-stage heat bulb on the thermostat. Circuit R-W2 energizes the heat sequencer. The completed circuit will energize the supplemental electric heat.

Blower Time Delay. This unit is equipped with timed on and a timed off relay. This relay delays the start and delays the stopping of the indoor fan motor to maximize the efficiency of the unit.

Defrost. Supplemental heat during defrost can be provided by connecting B on the blower coil to the defrost relay on the oudoor heat pump. This will complete the circuit between R and B (in the blower coil) through a set of contacts in the defrost relay in the outdoor unit when the unit starts the defrost cycle. This circuit, when it is connected, will help prevent cold air from being discharged from the indoor unit during the defrost

Blower

Units through three tons are supplied with a multi-speed (high, medium & low) motor with direct drive blower wheel which can obtain various air flows. One and one half ton units are factory wired on low speed, two ton units are factory wired on medium speed and two and one half ton units are factory wired on high speed. If a different motor speed is required, disconnect all power to the unit, remove the factory wired indoor fan motor lead from the fan relay and place an insulated cap on the removed motor lead. Remove the insulated cap from the desired indoor fan motor lead, place a spade connector on the lead and connect it to the fan relay where the original lead was connected. The black motor lead is high speed, the red motor lead is low speed, and the blue motor lead (if available) is medium speed. Be sure to check the air flow and the temperature drop across the evaporator coil to ensure that you have sufficient airflow.

Start Up

Once all connections are completed, the unit should be started up and a check out of the completed system should be performed. Before performing any system test, make sure that all grilles, registers and dampers are open and set to the correct position. Also make certain that an air filter is installed in the return air prior to running the air handler.

A performance test should be completed in accordance with the outdoor equipment manufacturer's instructions. Airflow tests should be conducted in the heating and cooling modes to ensure satisfactory operation.

Maintenance

The system air filter(s) should be inspected, cleaned or replaced at least monthly. If the filter is mounted internal

to unit, make sure that electrical power is disconnected before removing the access panels. Make certain that the access panels are replaced and secured properly before placing the unit back in operation. This product is designed for dependable service; however, periodic maintenance should be scheduled to be conducted by trained professional service personnel. This service should be conducted at least annually, and should include testing and inspection of electrical and refrigerant components. The heat transfer surface should be cleaned. The blower motor is permanently lubricated for normal operating conditions.

Warnings

Do not store or use any corrosives or combustibles in the vicinity of this unit. All panels must be in place and properly secured before operating this equipment.

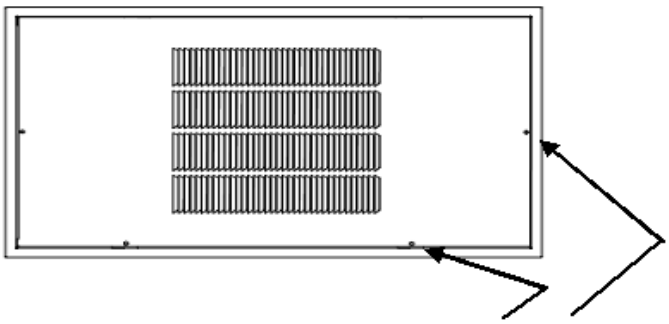
All electrical power servicing this unit must be disconnected prior to removal of any panels. Service of this unit must be accomplished by qualified trained professional personnel only

Conforms to UL STD 1995

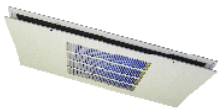
THIS UNIT IS MANUFACTURED IN THE USA BY:

AllStyle Coil Co., LP
7037 Brittmore
Houston, TX 77041

CEILING ACCESS PANELS						
FOR MODEL	PANEL NO.	DESCRIPTION	CEILING PANEL OPENING		PANEL FRAME DIMS. (OUTSIDE)	
30" Coil	PL-3975	LOUVERED	24-1/2"	40"	28"	43-3/4"
	PS-3975	NON-LOUVERED	24-1/2"	40"	28"	43-3/4"
36" Coil	PL-4575	LOUVERED	24-1/2"	46"	28"	49-3/4"
	PS-4575	NON-LOUVERED	24-1/2"	46"	28"	49-3/4"
42" Coil	PS-5175	LOUVERED	24-1/2"	52"	28"	55-3/4"
	PS-5175	NON-LOUVERED	24-1/2"	52"	28"	55-3/4"



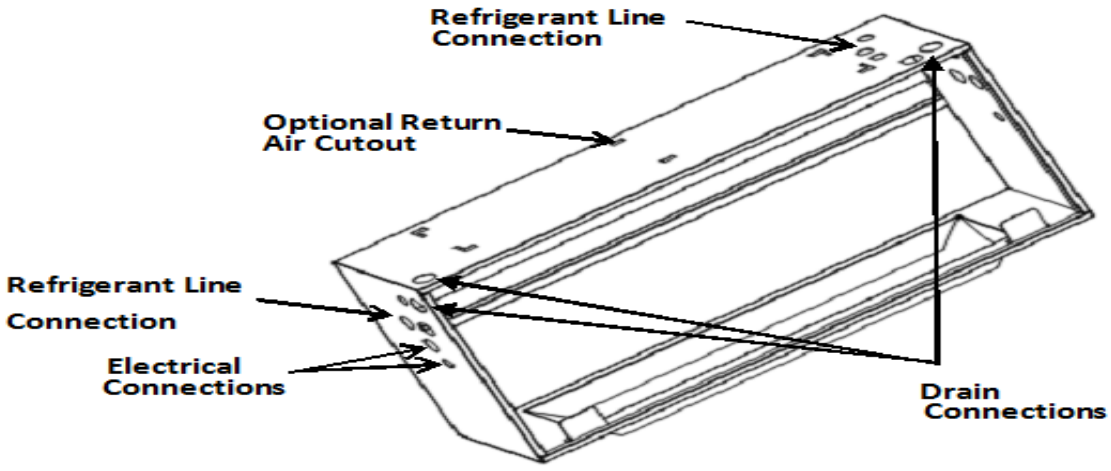
#PS-3975, PS-4575



#PL-3975, PL4575
(Louvers may differ from picture)

(field supplied)

ENCLOSURE CONNECTION LOCATIONS



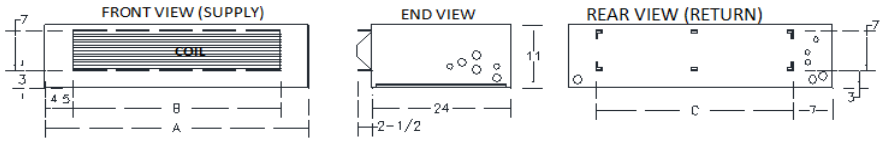
Housing with Ceiling Panels

(Housings and panels are standard with ALL "-H" models or can be ordered separately as a accessory kit)

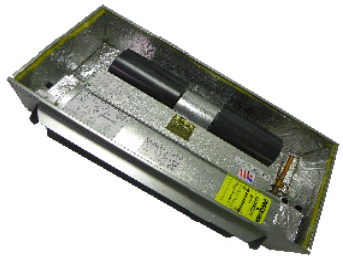
CEILING PANEL/ENCLOSURE INFORMATION												
FOR	HOUSING	HOUSING DIMENSIONS			FOR	PANEL	DESCRITION	CEILING PANEL		PANEL FRAME DIMS.		(See panel pictures above)
MODEL	NO.	H	W	D	MODEL	NO.		OPENING		(OUTSIDE)		
30" Coil	3975	11"	39-3/4"	24"	12,18,24	PL-3975	LOUVERED	24-1/2"	40"	28"	43-3/4"	
					30 HF	PS-3975	NON-LOUVERED	24-1/2"	40"	28"	43-3/4"	
36" Coil	4575	11"	45-3/4"	24"	36 HF	PL-4575	LOUVERED	24-1/2"	46"	28"	49-3/4"	
						PS-4575	NON-LOUVERED	24-1/2"	46"	28"	49-3/4"	
42" Coil	5175	11"	51-3/4	24"	37 HF	PL-5175	LOUVERED	24-1/2"	52"	28"	55-3/4"	
						PS-5175	NON-LOUVERED	24-1/2"	52"	28"	55-3/4"	

NOTES:

- These housings are shipped with units installed unless specified otherwise.
- Customer needs to specify on order which panel is wanted.



ENCLOSURE DIMENSIONS				
FOR MODEL	ENCLOSURE NO.	A	B	C
30" Coil	3975	39-3/4	30-5/8	30-5/8
36" Coil	4575	45-3/4	36-5/8	36-5/8
42" Coil	5175	51-3/4	42-5/8	42-5/8



KNOCKOUT FOR DUCTED RETURN (Requires filter grille-field supplied) (Ducted return requires non-louvered panel)

Expansion valve kit (Heat pump and Cooling only)		
PART NO.	**TYPE**	**FOR**
RP31114	R-410A	1-2 Tons
RP31115	R-410A	2.5-3 Tons
RP31117	R-410A	1-2 Tons
RP31118	R-410A	2.5-3 Tons

Heat Strip Kit		
PART NO.	KW MODELS	
RP16215	3 KW	Requires (2) 1.5 Kw Elements
RP16220	4 KW	Requires (2) 2.0 Kw Elements
RP16224	5 KW	Requires (2) 2.4 Kw Elements
RP16230	6 KW	Requires (2) 3.0 Kw Elements
RP16240	8 KW	Requires (2) 4.0 Kw Elements
RP16248	10 KW	Requires (2) 4.8 Kw Elements

Notes:

Expansion valve kits are approved for both heat pump or cooling only (non heat pump) applications.

Valves are factory installed or field installed.

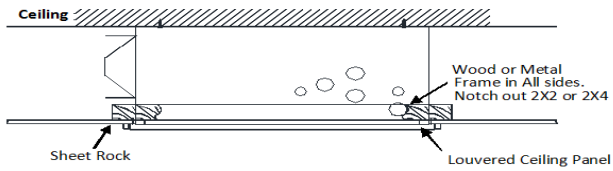
Contractor friendly screw-on connections.

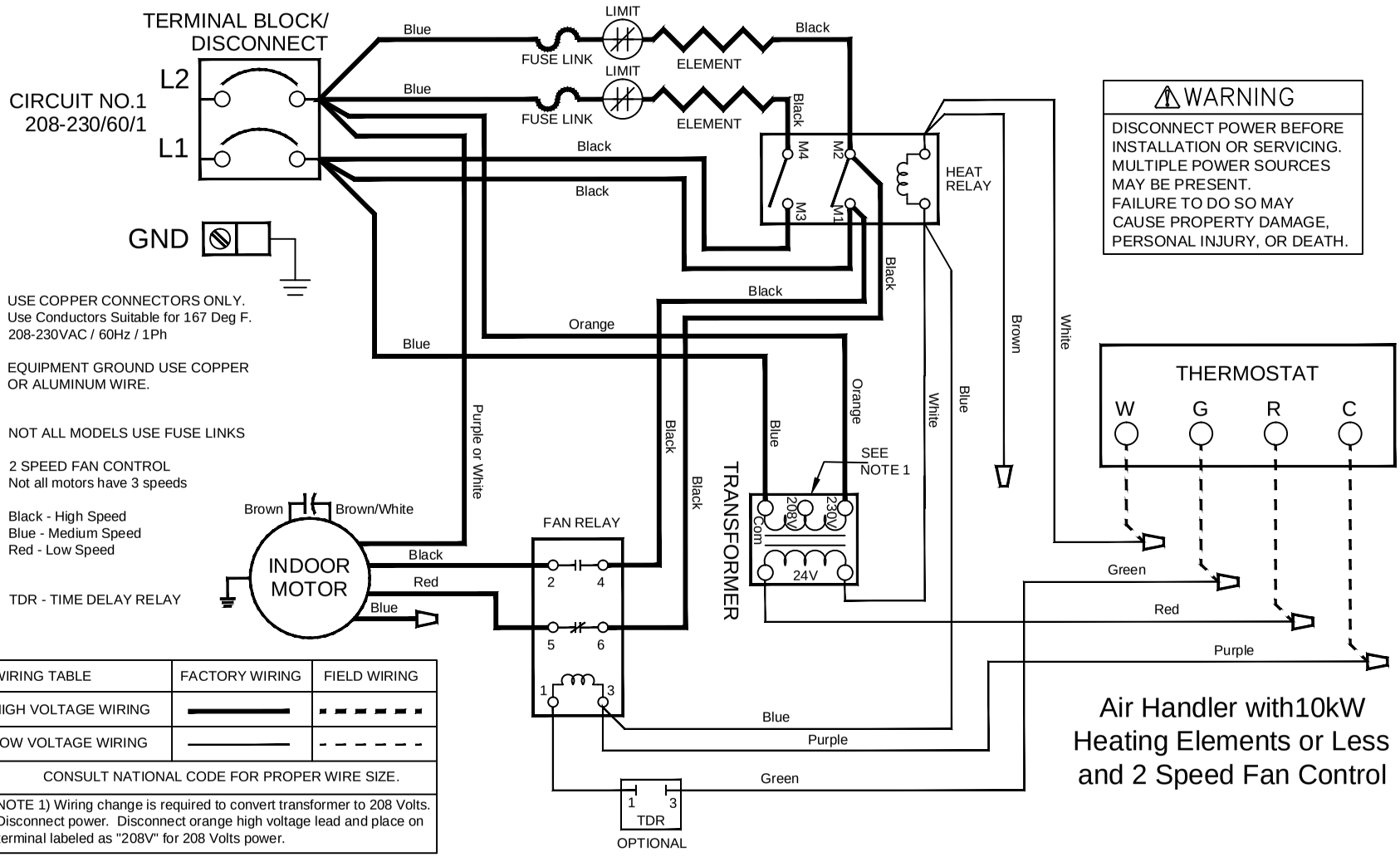
Valves are external equalizing, internal bleed.

+V For cooling only valves Ex.HF18-30840G+V+5+H

+VP For heat pump model valves Ex. HF18-30840G+VP+5+H

ENCLOSURE INSTALLATION SUPPORT FRAMING





WIRING TABLE	FACTORY WIRING	FIELD WIRING
HIGH VOLTAGE WIRING	▬▬▬	▬ ▬ ▬
LOW VOLTAGE WIRING	———	- - -
CONSULT NATIONAL CODE FOR PROPER WIRE SIZE.		
NOTE 1) Wiring change is required to convert transformer to 208 Volts. Disconnect power. Disconnect orange high voltage lead and place on terminal labeled as "208V" for 208 Volts power.		

AW1201-55324

AllStyle Coil Company, L.P.

Evaporator Coil Installation Instructions

These instructions are for the use of qualified individuals trained and experienced in the installation of HVAC equipment and related components. Installation and service personnel are required by some states to be licensed. Unqualified personnel should not install this equipment nor interpret these instructions. These instructions must be used only in conjunction with the installation of AllStyle coils and are intended only to advise and assist the installer. Read them fully before attempting installation. This product is designed and manufactured to permit installation in accordance with the local and national building codes. It is the responsibility of the installer to install this unit in accordance with these codes. Improper installation may damage equipment, create a hazard, and void warranty.

Coil Preparation

This product has been manufactured to precise quality standards, however, damage may have occurred during transit, handling or storage. Inspect the coil to insure:

- Drain connections are tight and openings are clear.
- Straighten any bent or damaged fins.
- Manifolds are intact and not damaged.
- Any other apparent damage.
- Unused drain ports must be capped or plugged.

Coils with Florator Restrictors

Coils are shipped with a bi-directional piston type florator refrigerant metering device. The piston is sized to the nominal tonnage of the coil as indicated in the model number of the coil. If possible, obtain the recommended piston size from the manufacturer of the outdoor unit. If this information is not available, then follow these instructions:

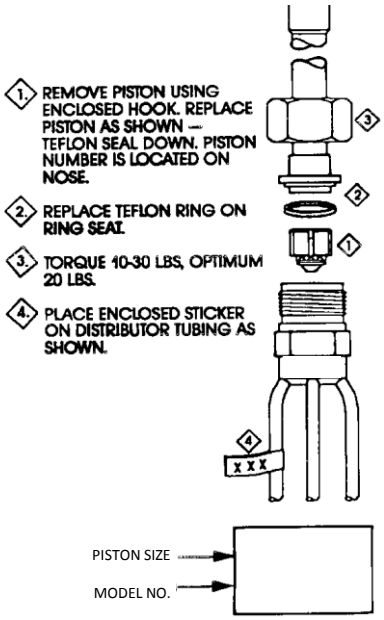
If the nominal tonnage capacity of the outdoor unit is not what is indicated on the coil model number, use the chart below to select the correct piston size to match the capacity of the outdoor unit. If the application requires, the installer must change the piston. Also, use the following chart to size the piston when matching the coil with an outdoor unit rated at 13 SEER.

OD Unit Cap.	R-22 11+ SEER Orifice Size	R-410A 13 SEER Orifice Size
18,000	.053	.047
24,000	.063	.055
30,000	.067	.059
36,000	.074	.067
42,000	.078	.074
48,000	.084	.078
60,000	.094	.084

The piston should be sized according to the capacity of the outdoor unit. Failure to install the proper piston can lead to poor system performance and possible compressor damage.

To Change the Piston

1. The piston is located on the front panel of the coil case or in the case of the uncased coil, over the drain pan. Use a backup wrench and unscrew the two halves of the distributor (on cased coils, this step is not required).
2. Remove the piston shipped with the coil and install the correct piston in the distributor body, it should be free to slide inside the distributor body.
3. Do not over tighten the Florator body when reassembling. Make sure the Teflon seal is in place prior to mounting the stub to the distributor body. Tighten the connection to 20 foot pounds of torque.


1. REMOVE PISTON USING ENCLOSED HOOK. REPLACE PISTON AS SHOWN — TEFLON SEAL DOWN. PISTON NUMBER IS LOCATED ON NOSE.
2. REPLACE TEFLON RING ON RING SEAT.
3. TORQUE 10-30 LBS. OPTIMUM 20 LBS.
4. PLACE ENCLOSED STICKER ON DISTRIBUTOR TUBING AS SHOWN.
XXX
PISTON SIZE
MODEL NO.

Field Mounted Expansion Valves

Use only AllStyle Expansion Valve Kits. Refer to the installation instructions packaged in the expansion valve kit. (Contact factory for TXV options and availability).

Model No.	Part No.	Application
AS2VN2	31036	1 - 2 Ton A/C R22
AS2VN3	31072	2.5 - 3 Ton A/C R22
AS2VN4	31073	3.5 - 4 Ton A/C R22
AS2VN5	31074	5 Ton A/C R22
AS2VPN2	31109	1 - 2 Ton HP R22
AS2VPN3	31105	2.5 - 3 Ton HP R22
AS2VPN5	31106	3.5 - 5 Ton HP R22
AS4VT2	31114	1 - 2 Ton A/C R410A
AS4VT3	31115	2.5 - 3 Ton A/C R410A
AS4VT5	31116	3.5 - 5 Ton A/C R410A
AS4VPT2	31117	1 - 2 Ton HP R410A
AS4VPT3	31118	2.5 - 3 Ton HP R410A
AS4VPT5	31119	3.5 - 5 Ton HP R410A

Factory Installed Expansion /Check and Expansion Valves

- The TXV sensing bulb is shipped attached to the suction line stub. The bulb should carefully be repositioned to allow the field suction line to be connected to the coil. Once this connection has been welded and allowed to cool, then position the expansion valve sensing bulb on the suction line (preferably in a horizontal run just outside the cabinet). The sensing bulb must make direct contact to the suction line.
- Utilizing the mounting straps, secure the bulb to the suction line. The bulb must be mounted at the 10 or 2 o'clock location for optimum performance, this mounting location guards the sensing bulb from false readings due to air or liquid in the suction line.
- Insulate the suction line and the sensing bulb to prevent ambient air from causing false readings.
- Coils with non-equalizing expansion valves may require the use of a hard start or start assist kits. Follow the outdoor unit manufacturer's guidelines.

Coil Installation

- Coils must be installed on the discharge side of a gas furnace or in an insulated air handler.
- Install:
  1. Cased vertical coils on a level flat surface.
  2. Uncased vertical and horizontal coils on a level flat surface, then raise the rear of the coil one-half inch to provide positive drainage to the drain connection.
  3. Condensate drain(s) in accordance with local building code requirements. **Use teflon tape to connect the drain line to the plastic condensate connection on the coil. Do not use solvent base pipe dope. Hand tighten the connection. Do not use excessive force.**
  4. If a secondary drain is required, it must be run separately from the primary drain and should terminate in a highly visible location.
  5. When a coil is installed on the negative pressure side of a blower, the drains must be trapped to insure condensate drainage.
  6. When coils are installed above ceilings or in other locations where damage from condensate overflow may occur, it is required that an auxiliary drain pan be installed under the coil cabinet. Drain lines from an auxiliary drain pan must be installed, but should not be connected to the primary drain line of the coil.
  7. Drain lines must be installed with a 1/4" per foot pitch away from the coil to provide free drainage. A condensate trap should be installed to ensure proper drainage. If installed, the trap should be located in the drain line below the bottom of drain pan.
  8. Drain lines must be adequately supported such that the weight of the drain line is removed from the coil drain connection. Long horizontal runs of drain lines located above a finished area should be insulated to prevent sweating and dripping.
  9. Refrigerant lines should be sized by the outdoor unit manufacturer's recommendations.
  10. Braze all refrigerant connections while flowing nitrogen through the pipe. Make certain that a liquid line drier is present in the system.
  11. Prior to charging the system, leak check the entire installation utilizing nitrogen or other suitable means. Dehydrate the system by pulling a deep vacuum sufficient to remove any moisture that may have entered the system.
  12. If a time relay is utilized, adjust it for the optimum delay recommended by the outdoor unit manufacturer.
  13. Seal the coil cabinet and all connections to create an air-tight seal. Insulate the suction line.

System Charging

Follow the instructions provided with the outdoor equipment manufacturer for coils with a piston/orifice metering device (See section "Coils with Florator Restrictors"), if they are not available, follow the guidelines listed below. Use the following guidelines for coils with an expansion valve.

- Set the airflow of the air handling unit to the recommended level. If uncertain, set air flow to 400 CFM per nominal ton of capacity of the outdoor unit. Do not allow static pressure drop across the coil to exceed .30".
- ***Florator coils***. Add refrigerant until the superheat measured at the outdoor unit suction line matches the superheat from the chart below.
- ***Expansion Valve Coils***. Add refrigerant until the subcooling measured at the outdoor unit liquid line matches the subcooling value listed in the outdoor manufacturer's instructions, if they are not available, use the value from the chart below. If you have an adjustable TXV, adjust superheat on TXV to obtain 10degF superheat nominally at the outdoor unit suction line (normal range 8 to 12 degF).

OAT degF DB	SUPERHEAT degF DB			SUBCOOLING degF DB		
	MIN	NOM	MAX	MIN	NOM	MAX
65	35	40	45	5	10	15
70	31	35	39	5	10	15
75	26	30	34	5	10	15
80	22	25	28	5	10	15
85	17	20	23	5	10	15
90	13	15	17	5	10	15
95	8	10	12	5	10	15
100	4	5	6	5	10	15

Contact AllStyle if you have any Questions. Please provide information on coil, outdoor unit, outdoor ambient temperature, metering device, pressures, superheat and subcooling, airflow and indoor temperature.